BOSTON PUBLIC LIBRARY,
ROXBURY BRANCH.

WAR DEPARTMENT,
RECEIVED
MAR 13 1909
LIBRARY.

AMERICAN JOURNAL
OF
PHOTOGRAPHY

THOS. H. McCOLLIN, Managing Editor.

JULIUS F. SACHSE, Editor.

VOL. XVII. SEPTEMBER, 1896. No. 201.

EXCELLENCE IN PORTRAITURE.

BY XANTHUS SMITH.

TOO much interest cannot be attached to the subject of portraiture. It matters not whether it be in the complete work upon canvas of the painter or the finished production of the photographer; every one will admit that it is of paramount importance that a true, and as far as possible elevated, representation of human kind should be preserved to us.

Whenever a people have attained to any considerable degree of civilization, as far back as we have any records of, the art of producing likenesses has been practiced, and in proportion as the people have been more or less highly cultivated the art has flourished in a greater or less degree of perfection.

The Greeks prove, by what little has been preserved to us, to have been highly eminent in the art of sculpturing heads, and there is little doubt that they possessed portrait painters who rivaled in skill their brother practitioners in the art of sculpture. Whether the bust that we have of Homer be an actual portrait or simply an ideal head, it is clear that an artist who could produce such a work from the imagination alone would be capable of portraying in the most masterly manner an individual placed before him possessing a noble and intellectual countenance.

That there is a certain inexplicable power which enables some

painters to portray a head, and give a peculiar dignity and interest to the countenance, cannot be controverted. We have only to refer to, as common instances, the portraits of Washington and Lincoln. It happens that these great men were portrayed many times. We all have easy access to numbers of the portraits of them. Lincoln had the additional advantage of being photographed, and we can readily see how differently they are made to appear in character and in dignity. Some are merely matter of fact portrayals, commonplace enough, indeed; whilst others inspire in us that feeling of interest and reverence which, no doubt, we would at times have felt if in actual presence of the great men themselves. In the case of Washington we have several portraits in which the artist in striving to make a likeness by copying with the most reverend and minute care every outline and detail, has overlooked the breadth of character and genius in the man, and given us no better likeness than Stuart or Trumbull have done. The former, with an extremely simple and broad treatment, conveying all the calm dignity of the great man, and the latter by subordinating details, and throwing a certain fiery impetuosity into the face, conveying to us the great general under the fire and excitement of battle.

Although it is held by the majority, and perhaps justly enough, that photography is no more than a mechanical art as compared with the work of the painter, who trusts to eye and hand alone in the execution of his work, yet it must be admitted that there is about as wide a difference in their work as there is in the work of the painters.

There is no doubt but that certain of those who pursue the art of photography have a natural gift which enables them by nice discrimination in the various acts of lighting, posing, and in the after processes of their work, to produce portraits far above the average productions of their fellow craftsmen, not only as pictures, but as likenesses diverted of commonplaceness of expression. To put the case strongly, one photographer will give a certain dignity to a very commonplace individual, whilst another will make a comparatively dignified head appear ludicrously mean.

The lines of success are extremely narrow indeed. Extreme

softness and delicacy soon degenerate into insipidity, grace into affectation, and brilliancy and force of contact are close upon the borders of that hardness and harshness which is one of the most objectionable qualities in a photograph or in any work of art, be it painting, engraving, or photograph.

In studying the most successful portraits by eminent painters, we always find that there is to a great extent simplicity of management. The more accessories we have the more difficulty there will be in managing them so that they will not interfere with the principal aim of the work, which, if it be a fine artistic head, should be the one great attractive feature, and should, by our utterly subordinating the surroundings, instantly attract and fasten the attention of the spectator.

It is an everyday occurrence to see in the exhibted work of the professional photographers the most glaring examples of violation of the above good principles, and almost invariably in ladies' portraits. Not only are the extravagances of dress brought out with the most flaring conspicuousness, but too many things are brought together as surroundings, backgrounds with clumsy architectural features in strong relief, and elaborately ugly furniture and abominable bric-a-brac are bestowed with a plenteousness that would rather suggest the exhibition by the photographer of the resources of his gallery, than that he wished simply to overcome that appearance of absolute bareness which too much simplicity may run into. Then when, as is very often the case, with all the fuss and over-crowding, the head and face are thrown nearly or entirely into shadow and happen against a space of shadow in the background, we are compelled to search for that which should present itself boldly to us.

Undoubtedly this over-crowding in studio portraiture is to a great extent forced upon the photographer by the demands of ill-diverted taste. So many persons are captivated by what at the moment happens to be fashionable, that if they see themselves or their friends posed amongst those objects which they are daily discussing, and striving to acquire it at once, gives them a sense of gratification, and they do not hesitate to settle upon such fashionable pictures, so that perhaps from a mere business point

of view a good deal of studio work must come into existence, and go for what it is worth. When we deal with a better and more lasting class of portraiture, however, we must not always give way to these whims of fashion, but must adhere to the good, sound underlying principles of art.

There can never be too much said about the importance of securing an ample amount of half-tones in photographic work. The days of harsh raking lighting and under-exposure have gone by. The best workers have discovered the extreme value of those delicate gradations of half light and half shadow which give so much softness and harmony and finish to fine photographic work, and which, indeed, constitute one of the highest values of photography as an art.

We are pleased each year to see photography advancing. Five years ago we might have supposed, in fact we often felt, that no more could be done in the way of fine portraiture by photography than that which was exhibited by our best photographers, and yet to-day, we must admit, that a degree of perfection has been attained which surpasses all previous efforts. There is a delicacy and refinement in much of the careful work which is truly fascinating to those who have made a study of art, and even the unlearned or casual observer will dwell upon such work with interest, though, if asked why, he would be, no doubt, unable to inform you.

A very great deal of the excellence that we now see in portrait photography is evidently the result of particular care in the chemical manipulation. A photographer may make or mar his artistic merit, to a much greater degree than would generally be supposed, by his dark room practice. By great care and skill in the development of his plates he may put into them all those higher qualities of delicate surface modeling which are so striven after by artists, and which in the matters of flesh painting are only attained by the most talented.

Until lately too much reliance has been placed upon the art of retouching to attain delicate gradations in flesh photography. While it is true that a skillful retoucher may do a great deal for a head, yet it is undeniable that when very much retouching is

done there will be a certain mechanical evenness which is not like nature's work, and much retouching almost invariably runs into hardness. In photography nature has provided an exquisitely beautiful means of doing delicate modeling in light and dark, and when the subject is good and the lighting proper, she will do it infinitely better in her own way than when aided by an imperfect art such as that of the retoucher's, which should be looked upon more as a mechanical means of removing blemishes than as an art.

We feel that we cannot close our remarks without disparaging all *tricks* of posing and lighting and focusing for the regular run of portrait work. Shadow pictures, and pictures devoid of shadow, and heads tossed at all angles, and faces thrown out of focus, are well enough as experiments, and we must admit that we sometimes see very charming things happened upon, where the head experimented with just fits the treatment, and the narrow line between success and failure has not been crossed, and when successful such work is attractive at exhibitions and in show cases from its novelty and piquancy; but in the daily practice of the studio it is far safer to adhere to quiet simplicity in the posing and a mode of lighting which will round out the features to the best advantage.

A Paltry Photo Causes a Big Fight.—It is a well-known fact that many of the uncivilized, or half-civilized races, have an intense dislike to being photographed or sketched. A story is told by Sir John Lubbock, in his "Origin of Civilization," of a big fight caused by a profile photograph of Mahtochuga, a redskin chief. An Englishman took a profile portrait of this chief, and presented him with a copy. His followers were exceedingly wild about this, saying that their chief was never afraid of looking anyone in the face; whilst his rival chief, Shonka, said that the photographer knew that Mahtochuga was a coward, or half a man. This led to a fight and Mahtochuga was killed, and his followers killed both Shonka and his brother, and all about a paltry profile photo.

A PHOTOGRAPHIC RAMBLE.

JULIUS F. SACHSE.

ENCAMPED for a few weeks within the bounds of the Chautauqua grove of Pennsylvania, upon the shady hillside of Mt. Gretna, the spare time when not in forum or auditorium was utilized in searching out picturesque bits, food for the camera, and recording them upon the sensitive dry plate.

This pastime naturally carried the thoughts of the writer to the beautiful Lebanon Valley, which nestles between the South Mountain and the Kittatinny Range, and extends southward for some sixty miles.

This valley, one of the richest and most fertile within the Keystone State, is known not only for its natural beauty and mineral wealth, but for its historical associations and the thrift of its inhabitants as well,—typical Pennsylvania-Germans, many of whom still till the paternal acres which were bought from the Indians by their ancestors when the stream of German Palatines came down the Susquehanna from the province of New York into Central Pennsylvania.

The historical student, the artist, and the devotee of the black art (photography) will here within this beautiful valley find enough material to supply their cravings. The valley, watered by innumerable streams and rivulets, is dotted with ancient mill-seats, many of which are still moved by the large, picturesque, unhoused wheel. Here are to be found almost every kind of ancient water-mill, the stone grist and chop-mill, with date stones perhaps showing some year in the fourth decade of the last century; the frame saw-mill, with its pit-saw and crude log-carrier; the fulling mill, where the homespun woolens were stamped which clothed the sturdy pioneers as they sallied forth to protect their homes against the French and Indians in the days of Braddock and Bouquet, and later furnished raiment for our ancestors who shivered upon the hillsides of Valley Forge and subsequently forced the proud Briton to lower his colors to their prowess at Yorktown.

Here also may yet be found a "trip hammer forge," with breast wheel still in place. A little further on stands a boring mill, where the revolutionary rifle barrel was bored and finished.

In many a vale within this valley may still be seen the original block house or log cabin of the emigrant of old, with its hewn timbers, narrow sliding windows, and loopholes for defence against the murderous savage. It is not uncommon to find one still tile-covered, a precaution taken to make the roof safe against the fire arrows of the Indians.

These humble structures, now vine-clad with mossy roof, are still kept in repair by the different families as a monument to the early pioneers of the valley. Here and there even a thatched stable is still to be seen, where the seeds, borne upon the winds, have grown and in course of time have transformed the straw thatch into a sod roof, impervious to storm, heat or cold.

A few of the old Indian forts also yet remain as an interesting object lesson for present generations. These are stone houses, built as a refuge for the farmers and their families in case of a sudden attack by either French or Indians. All of these ancient landmarks, mostly standing upon the banks of a stream, so distinct in their humble architecture, and now mossy and vine-clad, oft set with a background of primitive forest trees, all present exquisite bits of picturesque composition, a delight to the true artist, no matter be he one of the brush, pencil or camera.

To exploit the beauty, topography and historical associations of this valley, a party of four was formed, under the guidance of Mr. J. H. Redsecker, of Lebanon, a gentleman who for years wielded the editorial blue pencil in Central Pennsylvania and is well remembered as the author of "Across the Continent." His companions were the Rev. P. C. Croll, the historian of Lebanon Valley; Rev. W. E. Stahler, a lecturer of note; and the writer, with his camera and outfit.

The objective point of the trip was the peaceful and romantic vale within the valley proper known as the Millbach (Mill Creek) valley. The stream from which it is named taking its source upon the mountain side, gathers up rill after rill, spring after spring, as it gushes from the rock, until it finally becomes

a stream with power and fall enough to turn the many mills which stand upon its banks, until it finally flows into the historic Tulpehocken, a stream whose name and valley is well known in Pennsylvania-German history.

The start was made from the town of Lebanon early in the morning of the last day of July. The air was clear, cool and breezy. The route led from the county seat towards Schaefferstown, the oldest settlement within the valley. After a drive of eight miles through a beautiful farming country, our approach to the old settlement was indicated by several log cabins by the roadside, still covered with the red tiles burned by the settler and placed there almost a century and three-quarters ago. Upon getting into the town proper, picturesque bits and artistic vistas opened out at every turn.

The town, originally laid out upon a single street, which later became a part of the old post road from Reading to Lancaster, widens at the intersection with a cross road in the centre of the town into an open space or square, where the markets are held. At one corner stands the old colonial tavern, now modernized. Once the swinging sign-board, as it hung in its yoke high up in the air, carried the effigy of King George; in later days it became known as the "Franklin." The cellar of this old house consists of a series of massive groined stone arches, upon which the tavern proper is built. Tradition states that the cellar was intended as a place of refuge and defence, and upon more than one occasion well served its purpose.

Schaefferstown is also noted as having the oldest public waterworks in the United States. The pure spring water is brought down from the mountain side by a series of pipes and supplied to the houses on the main street. At regular distances there are placed public fountains and water troughs, where man and beast may quench their thirst,—thus antedating our modern fountain societies by over a century and a half.

Many are the quaint and picturesque views to be obtained along the old provincial post road as it passes through this ancient country town. Turning southward, a little below the "square" another public fountain meets our view; to the right

an ancient hostelry, a "wagon stand," long since relegated to domestic purposes; to the left several primitive log cabins—still happy homes—cool in summer and warm in winter. At the corner of an intersecting lane a modern frame house meets the eye. This house stands upon the site of the first Jewish synagogue erected in Pennsylvania,—an humble log sanctuary, with the Tabernacle of Jehovah, reared here in the wilderness as a shrine for the German-Hebrew fur traders who, appear to have settled in the valley at a very early day.

No trace of this community remains in the vicinity at the present day, except the old cemetery upon a hill-top less than a mile from town, now neglected, overgrown with briars, with stones displaced and either broken or carried off. In the archives of the Historical Society of Pennsylvania may be seen a Jewish prayer-book printed by William Weyman at New York in 1762, such as were once used by this congregation.

Walking up the old post road beyond the square, so as to get a shot with our camera at the oldest house within the town, a surprise awaited us. In front of the wheelwright shop stood a covered wagon, bright in its garb of fresh paint and striping of gold. Upon either side of the door at the back were placed a plate-glass mirror in a heavy gilt frame, one oval, the other square.

The legend on the sides told the passer-by that Bair & Son were the photographers of Schaefferstown and vicinity, and if patrons would not come to the studio in town, the artist could come to them and take their portraits, right then and there, at their own homes.

Beside the wagon stood a camera, two chairs, and four pointed rods, to hold a portable top screen and background. Here was certainly a revelation. While taking a survey of this portable outfit, we were joined by the senior proprietor, a typical Pennsylvania-German, to the manor born, and who, after asking us if we could understand or speak "Deutsch," as he knew little or no English, vouchsafed the information that the wagon was built and painted entirely by himself; further, that he had been in the photograph business ever since wet-plate times, but now confined

himself mainly to ferrotypes, as they paid better and were less trouble than regular photographs. He, however, was ready for all kinds of work within his line, and asking us into his house showed a number of prints, views such as farm buildings, etc., of various sizes, equal to the average work done in larger cities. During dull periods and rainy spells Photographer Bair spends his time in mounting birds and animals, his skill as a taxidermist being second only to that of photography.

One of the curious points about this traveling outfit was, why one of the mirrors should be square and the other oval, or in fact why there should be any mirrors on the van at all, unless it be for ornament. This was explained: they were placed there for the use of prospective patrons to show them the kind of picture they would take.

It was further stated that when one wanted a square picture, they looked in the square mirror, or if an oval picture was wanted the counterpart was first viewed in the oval mirror. Where sitters were undecided just how to be "took" they examined themselves in both mirrors and then took their choice.

It was not Professor Bair who gave us this information, but it was told the writer by a by-stander in all sincerity and good Pennsylvania-Deutsch.

After exposing our plates the party left Schaefferstown, and going north on the old post road, were soon upon the top of Prospect Hill, an eminence beyond the town, from which unfolds itself, at the feet of the tourist, a wonderful panorama of rural beauty. The scene is a typical Pennsylvania-German one. The clean and well-kept farms, herds of sleek cattle, large Swiss barns, dwelling houses set, as it were, in frames of brilliant-colored flower beds, waving cornfields, the dark green patches of tobacco, and extensive orchards all indicate the frugality and thrift for which the Pennsylvania-German is known throughout the length and breadth of our country.

Industrial enterprise is evidenced by the great iron furnaces which here and there dot the landscape. As an illustration, it is but necessary to mention those of Cornwall, Sheridan and Lebanon, as the reputation of their output extends beyond the confines of our own country.

Descending the Prospect Hill we gradually enter into the Valley of the Millbach (Mühlbach, *i.e.*, Mill Creek), a romantic vale within the valley of Lebanon. Clear, cold and sparkling as it courses, the stream turns burr after burr. Every way one turns romantic bits of scenery meet the eye,—comfortable homes, built when the Pennsylvania-Germans still owed allegiance to Britain's king, houses with stone walls firm enough to defy the storms of a century to come, with timbers of oak as hard as iron, moulded and carved by the craftsmen of last century.

A stop was made at just such a house, the home of Eli R. Illig, Esq. There it stands, near the old mill, with its quaint date stone and legend, which sets forth that "Wehr auf Gott getraut hat wohl gebaut." (He who trusts in the Almighty, builds upon a sure foundation.) The names of the builder and his wife, with the date 1752, complete the inscription.

The pointed walls, the wood-burned lime, now as hard as adamant, the window casings with small panes of glass, some of which may perhaps be specimens from the "Glass hütte" erected by "Baron" Stiegel in this vicinity a century and a half ago, all as firm as if built within the present decade.

Many such architectural specimens are to be found within this valley, and frequently where no deed has ever been made for the land, except the one which bears the "totems" of the Indian chiefs of old.

Royally welcomed were the four tourists by Miller Illig, and cheerfully shown through the house. Forced to refuse his kind offers of hospitality, we were sent upon our way after drinking several glasses of cool, rich milk.

There is another peculiarity of the romantic Millbach. This vale may be called the cradle of several of the peculiar religious sects for which the German counties of Pennsylvania have become noted. It was here, within sight of Illig's mill, where the Rev. Jacob Albrecht was awakened and founded the Evangelical Association, which is now spread over the whole country, and has lately been rent by a schism, which resulted in a division, thus forming two parties, known respectively as the "Bowmanites" and "Esherites." Within a short distance may be seen

the old Albrecht Church, now endowed as a memorial, the founder's grave and the house where the first conference was held. Here also, near where Illig's mill now stands, tradition points as the spot where once Conrad Beissel, the leading spirit of the Ephrata community of Rosicrucian Mystics, once reared his anchorite hut, and here in the romantic solitude composed a number of his hymns and theosophic epistles.

Leaving Illig's mill our path led down the Millbach toward Sheridan, where the party was scheduled for dinner. About a mile down the creek we pass a massive square stone building, reared in a meadow a short distance from the roadside; from under the building issues a stream of water somewhat like a modern spring-house. The windows are small and square, the whole appearance giving one an impression of solidity and strength. This quaint structure was one of the military outposts erected as a barrier against the savages during the French and Indian War. It is still known as Fort Zeller. The farm upon which it stands is still in possession of the family of the original emigrant, now in the eighth generation.

The old fort is so situated and overgrown with luxurious grape and flowering vines, that no satisfactory near-view could be taken of it, and the exposure had to be made from the roadside at some distance.

The old landmark was thoroughly inspected. It is in almost the identical condition as when used as a haven of refuge. The same crystal spring bubbles forth in the cellar, and feeds the stony confine adjoining, wherein sport dozens of speckled trout. The same yawning fireplace, with swinging crane and pothooks, opens out into the kitchen. Although long since disused as a dwelling, and made to do duty as a tool house and workshop, the arrangement of the interior is much the same as when the muzzles of the Iron carronades from "Baron" Stiegel's foundry frowned from the loopholes or lower windows.

An interesting episode connected with the old fort is its defence by a German woman, its sole occupant, against three marauding Indians. They approached the house during the absence of the men and women in the harvest field. The solitary

garrison observing them quickly closed and barred the door and started to secure the windows, not, however, before one of the savages reached an open one. The woman, seizing a meat axe, split his skull as he came through the little window, then, seizing the body, drew it into the house, and gave an Indian call to the others, as if nothing had happened. As they followed they both met the same fate, after which the alarm was given. When the men came running in with their arms, they found the victory won, and the foe annihilated by the prowess of an old German woman. This well-authenticated episode is not an isolated one in the history of the trying provincial period of our state.

As the party were inspecting the old fort, the present owner of the place, Monroe Zeller, the eighth generation from the sturdy German emigrant, came to meet us. He appeared the typical Pennsylvania-German farmer, who had just returned from the harvest field, his homespun clothing and cowhide boots, wide-brimmed straw hat, horny hands, bronzed face and heated brow seemed to verify the old biblical injunction that "one should earn his bread by the sweat of his brow." Cordial was the greeting; the sun, now at meridian, was exerting its full power, and the invitation to enter the cool stone mansion was cheerfully accepted. Entering the house a surprise awaited us. After inspecting a number of colonial relics, among which was a high case musical clock which played the "Battle of Prague" with drum accompaniment, the party were ushered into the host's private room, the *Sitzstube* or sitting room of the old mansion. On the floor was a plain hemp or rag carpet such as is woven by tenant farmers who have a loom during winter months; the furniture consisted of a few old style high-back chairs, and a plain oaken bench against the wall. This ranged the full length of the room, and was worn smooth and bright by the use of successive generations.

In one corner stood the usual "dish" closet, with a wealth of china pottery and pewter dating back to days long passed. In the opposite corner was an upright grand piano, beside it a rack of bound music. Upon the walls were a number of portraits, not of the ancestors or members of the family, but of the more or less

familiar faces of the world's greatest musicians, such as Liszt, Bach, Beethoven, Mozart, Weber, and others. The photograph of the first named, if we err not, bearing the autograph of the great original.

Our host in humble homespun, dust-begrimed from the harvest field, sat down at the piano, and without any flourish entered upon an *étude* of Cramer. This was followed with selections from Bach and Beethoven, and Gottschalk, ending with a rendition of the Faust valse by the Abbe Liszt. Rarely has it fallen to the lot of the writer, even in his extended travels, to listen to better music or see such wonderful fingering as was witnessed upon this occasion. An offer to photograph the room with the owner at the piano was kindly but firmly refused.

Further inquiry elicited the information that this plain unassuming Pennsylvania-German farmer was no less a person than Professor Monroe Zeller, well known at all the leading musical centres of Europe from Paris to Moscow, and who, strange as it may appear, divides his time between his ancestral farm in the Millbach Valley and the gayest capitals of Europe. In winter he is a petted virtuoso in the old world; in summer he again becomes the plain Pennsylvania-German farmer. Such was the writer's surprise and great musical treat.

After leaving the hospitable Zeller homestead, the trip to Sheridan furnace was a short one. Here dinner was taken. It was a typical Pennsylvania-German one. Resuming the route along the Millbach, the old colonial forge with its trip-hammer and boring mill was inspected and photographed. Here the visitor can see how the muskets were made which, in the hands of the sturdy yeomen of the thirteen colonies, hurled back the finest battalions of Europe. The crude appliances, the large breast wheel, the ponderous shaft, the quaint trip-hammer, and the open hearth at which the steel was heated and welded, the boring benches where the steel barrels were "rifled" and received their twist, which insured the accuracy of the bullet's flight,—all this is to be seen in this old mill, which nestles here in its romantic setting of emerald green.

A story is told about an artist who a few years ago was sent here to sketch the old mill. He expected to get through in an hour or two,—in fact, he intended to take the next train home after his arrival. However, as the story goes, after arriving upon the spot, the hours grew into days, the days into weeks, and almost a month passed before this artist again wended his way homeward, with a stock of sketches and studies enough to keep him busy during the winter season; and it may be well surmised that upon more than one canvas, in the following spring exhibition, our old mill found a prominent place.

Leaving the old mill a short drive brought us to the *Kluft*, a romantic gorge in the mountain through which the "Gold spring," a clear cold crystal rivulet, forces its way and purls over rock and ledge until it mingles its waters with the Millbach. Through this forge once led a noted Indian trail. Romantic and picturesque scenery and artistic nooks here open up at every turn, offering ample food for the modern camerist who is a lover of nature and has an eye for primeval beauty.

Retracing our steps a short distance, our horses' heads were turned towards the valley of the Tulpehocken. A drive of two miles brought us to the old Berks and Dauphin turnpike, one of the oldest "hard" roads in the State.

Here, within a short distance, cluster the historic Tulpehocken churches, known respectively as the Rieth, Ulrich, and Reformed; all of which have a history dating back to the early years of last century. A halt was made to photograph the different buildings, as well as some of the quaint German tombstones, with their curious emblazonry of skulls, cherubim, hour-glasses, scythes, and other mortuary symbols, which marked the resting-places of many early pioneers whose names are well known to history, and whose descendants bear a prominent part in the annals of our country, down even to the present time.

An interesting anecdote is told about a New England writer who once upon a time visited several of these old graveyards. Most all of the incsriptions commence with the line—

"Hier ruhen die Gebeine," etc.

("Here rest the remains," or, literally speaking, the bones or skeleton—a common expression among the Germans a century ago.) Now it happens that the word *beine* is the German for legs or limbs, and with the prefix *ge* (gebeine) is used as above stated. Now the Yankee's knowledge of the German was but superficial, and as he knew that *beine* meant legs, he stated in his account that upon every tombstone in the Pennsylvania Dutch graveyards it stated that *here rest the legs*, etc., but they failed to say where the rest of the remains were buried, and that he has been reliably informed that the old Germans only buried the femors within the churchyard.

By this time the sun stood well in the west, the orb was slowly sinking down behind the Kittatinny Mountains, the shadows were lengthening and admonishing us to turn homewards, so the horses were speeded along the smooth pike, through Myerstown, towards Lebanon, where the party arrived while the glow of the zenith was upon the sky. Boarding the train, nine o'clock found the writer once more in his cottage among the cool shades of Mt. Gretna, with every plate exposed and the mind filled with the pleasant recollections of the photographic jaunt through the Millbach Valley.

The mosaic work with which the crypt of St. Paul's Cathedral is paved was made by the female convicts at Woking Prison. The quarries of the Isle of Portland, in Dorsetshire, supplied the materials for St. Paul's Cathedral, and for all the most splendid buildings in London. About 70,000 tons of Portland stone are now exported annually from these quarries.

A prehistoric city, which apparently had a population of over 200,000, was discovered recently in Mexico by J. R. Reiley, an American archæologist. This ancient city is situated in a narrow valley between two high ranges of mountains. Nearly all the buildings are of brown stone, and are in a state of almost perfect preservation. The houses contain ornaments and utensils of peculiar design.

AN OLD PENNSYLVANIA POST-ROAD.
(SCHAEFFERSTOWN, LEBANON CO., PENNA.)

NEGATIVE BY JULIUS F. SACHSE.

PRINTING DIFFICULTIES IN HOT WEATHER.

THAT we are now passing through one of the most trying periods of the year scarcely any of our readers will require reminding; but, though the difficulties surrounding the use of our plate of to-day during hot weather are far less than they were ten years ago, the same cannot be said of our printing papers. Now is the season when the alum both becomes an absolute necessity with gelatine papers, and even with collodio-chloride it is a great aid to success. With the former, although the prints, with care, may pass safely through the ordeal of washing without damage, it is practically impossible to mount them. We have heard many complaints lately in this direction, and only a few weeks ago we experienced the difficulty ourselves with some gelatine-chloride prints that had been dried after washing, but without using the alum bath. They were rewetted previous to the mounting, but the gelatine surface proved more adhesive than the mountant, and, on rubbing down, they became firmly attached to the paper used, and, after effectually trying to save the first two or three, we were compelled to alum the rest.

During the hot and "thundery" period of last year, about this time, we heard a good deal about the effect of heat and thunder on gelatine films, but the most remarkable instance we have yet heard of the narrowness of the line that divides us from the borderland of danger with gelatine papers has just reached us from an amateur correspondent. It appears he had just finished toning and fixing a number of gelatine prints, and, though the weather was by no means sultry, it was close and "thundery," a storm actually occurring a few hours later. The prints had appeared more than usually tender, and had required careful handling, but had shown no signs of actual softening. The dish containing them had been left for a few minutes on the kitchen sink, when, on going to change the water, the coloring matter was seen to be oozing out from between the prints and the dish in precisely the same manner as our correspondent describes it—as from a piece of carbon tissue before stripping for development.

On attempting to lift the prints, those in contact with the bottom of the dish were found to have melted and become attached firmly to it, while the upper layers were perfectly intact. A subsequent inquiry showed that, during his absence, the domestic had emptied a saucepan of hot water into the sink, and this, flowing around the porcelain dish, had warmed it sufficiently to upset the "tottering state of equilibrium" of the gelatine and produce the result stated.

Many workers with gelatine papers object to the use of alum, on account of the difficulty of ensuring its complete removal after it has done its duty. Alum, we know, has been recommended as an eliminator of hypo, and in that capacity we know many have used it to their cost, and have come to regard it with no friendly feelings. The opinion so frequently expressed in these columns on the subject of hypo eliminators is well known, and we are inclined to agree with a statement we heard made a few days ago, that, of the two, alum is a more dangerous enemy to our prints than hypo. If carelessly used or imperfectly removed, it is undoubtedly so, and we can safely say, from our own experience, that we have had more cases of unstable prints from amongst those that have been alumed after fixing from those not alumed. Very probably, if the alum were applied before fixing, it would not prove so dangerous, because, knowing the necessity for its removal before passing the prints into the hypo, greater care would be taken in washing.

We are inclined to believe that a far safer application will be found in chrome alum, especially if it be first purified by Professor W. K. Burton's method of washing the powdered crystals with spirit. We have used it in place of ordinary alum, in solution of about four or five grains to the ounce, and, judging by the comparative effect produced by prolonged immersion, we should say it is far safer than that salt. If a print be cut into three portions and immersed in solutions of ordinary potash alum, chrome alum, chrome alum and hypo, the first will be bleached out or turned yellow in two or three hours at the outside, that in the hypo undergoes a very gradual reduction in depth, but no serious dis-

coloration, for perhaps twenty-four hours, while the chrome alum seems to make very little difference.

It has been recently recommended to alum collodio-chloride prints, in order to harden the gelatine under surface, and some operators perform this function before toning; but it cannot be too strongly borne in mind that, unless very completely removed before toning, the alum will cause great trouble. This has been pointed out in connection with gelatine prints, with which it has been recommended in order to counteract the softening effect of sulphocyanide. With collodion, owing to the nature of the film, it is not supposed to require so much washing to remove it. This is perhaps true so far as the collodion itself is concerned, but there is the gelatine film underneath to be considered also, for which reason we advise that at least as perfect washing be given, or else the alum left until after toning at least.

British Journal of Photography.

A Rare Occurrence.—On the afternoon of April 15th, 1858, six young men walked into the gallery of James F. Ryder, in Cleveland, Ohio, and requested the then young man to group the party and do his level best to photograph them. The result was a fine photograph of the set of young men, who had banded themselves together for social purposes and became known as the "Immortal Six." In the course of a few years the party became scattered and the members never met as a company until last July when the centennial of Cleveland was celebrated. The reunion was a happy one: old times were then talked over, and experiences and reminiscences exchanged. Incidentally that old photograph taken nearly forty years ago happened to be mentioned. That led to the remark that the photographer who took it was still doing business in Cleveland. And so, on July 4th, the same "Immortal Six," no longer beardless youths, but fathers and grandfathers and solid business men, most of them with their ambitions realized but their hearts as young as ever, visited Mr. Ryder's studio, in the Garfield building, and they had a second photograph taken, the subjects being grouped just as they were on the original of thirty-eight years ago.

THE APOTHECARY AS A PHOTO-STOCK DEALER.

BY J. FOCUS SNAPPSCHOTTE.

A PAMPHLET has lately been issued and distributed broadcast among druggists, apothecaries and cross-road storekeepers, setting forth in glowing terms how fortunes are to be accumulated by the sale of photographic supplies. The pamphlet seems to be the effort of one who signs him or herself with the high-sounding title of "Secretary of the American League of Amateur Photographers," an organization which, so far as our own investigations are concerned, we must confess appears to be a somewhat mythical one.

Nor have we been able to locate the headquarters of this great corporation. In fact, the reference smacks greatly of the well-known story of the "Tailors of Tooley Street." However, we will let that pass. No notice should have been taken of the subject, which by the way is marked copyrighted, were it not for the misleading tenor of the contents of the pamphlet, which is really a conglomeration of stale matter, and bears evidence of having been published in the interests of some chemical laboratory for the express purpose of booming their specialties.

Now this whole matter concerns the inexperienced amateur and the unsophisticated apothecary. It has nothing whatever to do with the professional photographer, photo-scientist or advanced and intelligent amateur, all of whom are well aware that their success depends fully as much upon the freshness and purity of the chemicals employed as upon the plates and optical appliances, and none of the above need advice from any official of an Amateur League as to what to use or who to purchase from.

It is well known to every professional and intelligent amateur that the regular photo-stock dealer, who is educated to the wants of the profession, has their individual interest at heart, and permits neither plate nor chemical to leave his place unless he is morally sure that they are fresh and first-class. Further, he has no occasion to deceive his customer; his success in business depends upon

them. If either chemicals or lot of plates do not come up to the full standard, they are at once returned to the manufacturer, who in turn replaces them, as the dealer is a large and valued customer.

How different the case with an apothecary who lays in a few dozen plates or a few ounces of chemicals of a kind to retail out by grain or scruple, which, by the way, are apt to deteriorate by becoming stale upon the shelves of such dealers as have but a limited demand for goods of this character. He has no recourse; his only remedy is to sell the chemicals at prescription rates.

A few illustrations which came directly under the writer's notice will suffice. A photographic friend, a few months ago, having use for four ounces of distilled water and thirty grains of citric acid, sent the order with a bottle to a neighboring apothecary. The order was filled at a charge of thirty-five cents. It is true the bottle was neatly wrapped in a piece of white paper and tied with a baby-blue string, but that did not make the solution any better.

In another instance, in a different part of the town, three ounces of hypo were called for. The salt was carefully weighed upon a well-balanced scale, not a grain over-weight; this was done up in a double white paper and tied with a pink string and a gilt label. Price 45 cents, or 15 cents per ounce. Upon the purchaser objecting to the exorbitant charge, he was blandly informed that "We only keep pure chemicals." This was supplemented with the information that photo-stock dealers handle refuse chemicals only.

When this case came to our notice a little investigation was started as to prices charged by apothecaries who made a specialty of photographic requisites for amateurs. The result was that hypo brought from 5 to 15 cents per ounce. One druggist sold it, put up in packages of one-quarter pound, under his own name as his special brand, expressly for amateur use, for 25 cents per package. Three apothecaries had no sulphite of soda, another kindly furnished half a pound of sodium carb. crystals for 25 cents.

Even the honorable secretary of the Amateur League of American Photographers quotes an instance where he was let off with twenty cents for a pound of hypo.

He further goes on to state that the druggist is not "in it" so far as concerns present trade relations with the photo-amateur. The writer agrees with him there, and will add that the intelligent apothecary who is wise unto his generation will stay out. He will not be deceived by any suave arguments from agents of concerns who fail to impress the professional bread-winner with the wonderful superiority of their wares, and now seek to unload them upon the village druggist.

The great bulk of photographic supplies will always be used by the professional and commercial branches of the photographic art, who will, as heretofore, look to the reputable stock houses for their supplies.

In comparison with the professional branch, the amateur guild is a comparatively small one; but even of the latter, the intelligent and painstaking ones will hardly be tempted to enter upon untried or risky paths so far as their supplies are concerned, and cannot be induced to go to an apothecary for chemicals or supplies unless he is caught away from home, or at unawares, in which case he expects to pay prescription prices. Such cases, however, are few and far between, and would hardly justify any retail druggist or apothecary to open a special department of photographic supplies.

"**Cleanliness is next to Godliness.**"—It is easier to keep clean than it is to get clean.

Boys, be clean, keep clean, don't be any other way except clean.

Keep your faces and hands clean, keep your whole bodies clean, keep your clothes clean, keep your words clean, keep your thoughts and imagination clean. "Create within me a clean heart, O God."

Keep your mouths clean, your teeth clean, your breath clean. Do not defile these with cigarettes or tobacco, or intoxicating drinks, or nasty stories, or coarse stories, or vulgar conversation.

Be "clean cut" in your business transactions, strictly honest, do a full day's work, pay every cent you owe or make some arrangement about it. Be *clean*—"clean through."

SNAPSHOTS AT LIGHTNING.

THERE is just a chance in 25,000 that you will be killed by lightning this summer.

These figures are based on carefully collected statistics, but it need not disturb your coolness during the next thunder-storm to contemplate them. Although the season has already been marked with several notable and tragic accidents and the prospects are that this year's lightning fatalities will number more than usual, you are in far more danger from trolley cars and other engines of violent death than you are of being struck by a bolt from the heavens.

The United States government keeps tab on lightning as well as on many other things, and it has been ascertained that the average number of people killed in this country by lightning every year is 200. Some other interesting facts have been collected by the weather bureau. In eight years 3,516 fires have occurred which were attributed to lightning, and the damage to property was something like $13,000,000. The records show that barns are more often struck than houses and that houses suffer more than churches. The records also show that more barns were struck in New York than in any other State in the Union. Pennsylvania comes next and Michigan third.

Many old ideas about lightning have been discarded of late years, since scientific observations have been made of the results of lightning strokes. One old saw that has gone over the board is the familiar one that "lightning never strikes twice in the same place." Lightning not only strikes twice, but many times in the same identical spot, and is the usual, rather than the unusual thing, for two or more strokes to follow the same course during a storm.

The scientific sharps of the weather bureau also tell us that there is no use trying to dodge lightning, and that the time-honored precautions which our grandmothers solemnly advised us to observe are entirely useless. They say that it is a popular delusion that it is unsafe to stand under a tree or in an open doorway during a thunder-storm, and they absolutely sneer at the

feather bed and the middle of the room idea. They must be in league with the dreaded lightning rod agents, however, for they declare that those almost abandoned devices are very useful and should be placed on all exposed buildings.

Only a few weeks ago one of the most notable tragedies of the season occurred in the upper part of New York. A young couple had taken refuge from the rain under a tree. They were lovers who had quarreled and had but a few hours before kissed and made up. A lightning stroke sought them out, and both were killed. Senator Tillman's daughter and a minister who accompanied her were killed in much the same manner only a couple of weeks ago. They were members of a party of excursionists who ascended a mountain near Asheville, N. C., and they stopped under a tree to avoid a wetting from a passing shower. Both were killed by a single stroke.

Another popular idea concerning lightning that has been proved false is in regard to the shape of its course. Until a few years ago every one believed that the path of a lightning bolt was an irregular zigzag, with sharp angles where the bolt took a notion to alter its direction. In all old pictures where lightning was depicted a zig-zag streak of white was used. For centuries artists stuck to this method and no fault was found with it.

But photography has shown that there are no angles in the course of a lightning flash. There are curves, but no sharp corners. It is not an easy task to take a snapshot of a thunderbolt, as you may imagine, but within the last ten years it has been done frequently.

Prof. McAdee, of the weather bureau at Washington, is probably the most expert photographer of lightning in the world. For the past two years he has devoted a good deal of time to the work, and he welcomes a thunder-shower as enthusiastically as a small boy does a circus. He is well situated for the work, for the Washington monument is sure to draw out an angry flash every time an electrically charged cloud passes over it. Prof. McAdee has three cameras trained on the top of the monument every night during the summer, and whenever there is a thunder-storm he and his assistants get snapshots of the bolts.

Were it not for the fact that the shaft is protected by a most elaborate system of lightning rods, it would probably have been shattered long ago. There are four copper conductors, with gold-plated and aluminum tipped points running from the tip of the monument into a well under the foundations, 600 feet below the capstone.

Prof. McAdee has invented appliances for anticipating lightning, and has even made calculations as to the dimensions, horse-power and direction of the stroke. Still, there are many things about lightning which are understood no better than 100 years ago. These are put down as freaks, and the scientific men are puzzling their heads to solve their meaning. They know that lightning always follows the path of least resistance, yet they cannot explain some of its antics.

For instance, at Wooster, O., a two-story bay window was cut away from the main structure of a house as if by a giant's knife. At Norwich, Conn., in 1892, a bolt went into the earth and jerked out 100 feet of iron water pipe. There have been several instances where bolts have played havoc with gas pipes, melting the iron pipes and igniting the gas.

There is an instance on record of the killing of a man by a lightning stroke where the reason for the course of the bolt was afterward discovered. The unfortunate victim was sitting in the center of a large room with all the windows and doors closed, but the bolt came through two upper stories, struck him down and went through the floor under his chair into the cellar. Upon investigation it was found that in the attic, hanging from a rafter and pointing directly toward the man in the chair, had been a saw, while below the man, in the cellar, was an iron crowbar. This unfortunate man simply formed a link in a broken conductor. Upon such incidents as these story writers found tales in which the assassin's knife is knocked from his hand, and he is stricken dead by a providential bolt frem heaven. Such incidents may have occurred, but there is not one well-authenticated case on record. Still, the lightning stroke is a great help to writers of fiction in disposing of heavy villians.

Lightning is as erratic in its results as in its course. Sometimes it sears, again it shatters. Men have been struck by bolts which have stripped their clothing into rags, melted watches and coins in their pockets and pulled the nails from their shoes, yet left them but little injured. In other cases persons have been instantly killed, and the bolt has left no sign of its fatal visit save a small bluish spot on some part of the body. Again, the bodies of victims have been marked in a most curious manner.

Persons are not always "stricken down," as the much-used phrase has it. They are sometimes lifted up by lightning. An instance of this sort happened in Missouri last summer. Two children were struck in a group of several persons composing a picnic party. The children were lifted three or four feet into the air and fell back dead. This is explained by the fact that the discharge is sometimes from the earth toward the clouds.

It is also known that a bolt does not always reach the earth, but sometimes returns to the clouds from whence it came. A photograph was taken by an enthusiastic amateur in Michigan of such a return stroke. In the course of another decade perhaps the scientists who are now making a study of lightning will have discovered all about its wonderful force and will be able to explain the reason for all the freaks which it now plays on wondering humanity.—*Cyrus Sylvester, in Brooklyn Times.*

A Few Years Hence.—The girl seemed ill at ease, and every time he took a seat near her she moved away.

"My dearest," he said, "You seem worried. Let me chase those tears away."

"Nary a chase to-night," she returned quickly, "and if you know what is good for you you'll keep away from me. Papa is sitting in the next room reading."

"But the door is closed," he protested, "and we can hear him if he makes the slightest move."

"But you can't hear him turn on the X rays," she answered, "and you can't tell when he will take it into his head to do it, either."

—*Chicago Post.*

PHOTOGRAPHY IN NATURAL COLORS.*

(Continued from page 375.)

It is found to be immaterial, so far as reproduction of colors is concerned, whether the film is prepared from the coarse-grained deposit that forms at the bottom of the collodion emulsion, or the fine-grained emulsions that constitute the upper part of the liquid. Even with the latter the grains are found to have a diameter of about 0.001 mm., and with such granularity the occurrence of regular standing waves is impossible, and the light must be very much scattered in passing through the film.

In Poitevin's process the conditions are even less suitable to the production of standing waves than in Seebeck's process, and yet the former gives a much better reproduction of colors. In making the prism observation with Poitevin prints (or, of course, any similar prints), it is found not to be advisable to moisten the whole paper with benzine, because it becomes more or less transparent, and consequently the colors as seen in air are duller. To get over this difficulty Wiener adopted a very ingenious plan. After a reference line had been marked on the colored spectrum through the yellow (parallel of course with the lines in the spectrum) the spectrum is cut through the middle in the direction of its length. One half is propped up against the face of a right-angled prism, so that it lies at an angle of 45° with the horizontal. The other half lies flat on the table with its side nearly touching the edge of the inclined half, and with the reference lines in the two parts lying in the same straight line. The right-angled observing prism is placed on the flat half of the spectrum, and the benzine is poured between. Although the colors under the prism lose something of their distinctness, there is no shifting of their positions. It follows that *in Poitevin's process*, as in Seebeck's, *the colors produced are pigment-colors* and not interference-colors. The sensitive material is substantially the same in Poitevin's as in Seebeck's or Becquerel's process, but in the former there may also be by-products, though most probably these, if

present, act only indirectly by altering the refractive index of the film.

The films of silver chloride in collodion (modified Seebeck's process), and the Poitevin films, are so transparent that they can be observed from the back both by transmitted and reflected light. It is then found that the spectrum colors are not only visible, but are to some extent more distinct when seen by transmitted light, and, further, they occupy the same positions when seen from the back of the films as when seen from the front. These facts afford further proof that the colors are pigment-colors, and the effects are produced by absorption and not by interference.

The observation just described has been made before by other investigators with the Seebeck and Poitevin and similar processes, but the same conclusion as to the nature of the colors has not been drawn from it. Perhaps this failure to see the true meaning of the phenomena observed may be attributed to the persisting influence of an error made by Zenker when expounding his orginal theory. In his book on Photochromy (page 81), he says, referring to colored images produced by light waves: "It is obvious that the same colors will be seen by transmitted light as are seen by reflected light, for the transmitted light clearly is not the direct continuation of the incident light, but has, in part at least, undergone repeated reflections, and in it must preponderate those colors to which the distances between the existing point-layers (that is, elementary mirrors) correspond."

Now, as a matter of fact, the transmitted colors that are really produced by the collective action of the reflection from the elementary mirrors must be complementary to, and not identical with, the reflected colors from the same point in the film, just as as in all true cases of interference. The reflected and transmitted rays must together make up the incident white light, and nothing can be lost, because (by Zenker's hypothesis) the colors are produced by interference and not by absorption.

What has just been said obviously holds good only when there is no absorption, as, for instance, in Lippman's process with bichromated gelatine. When absorption does take place, its effect

will be evident in the transmitted light, because the transmitted colors, as in the case of the colors of thin films, are mixed with a considerable proportion of white light, and therefore are relatively less intense.

In Lippman's silver-haloid plates, Krone observed by transmitted light nothing but the color peculiar to the precipitate produced by the developer. Wiener has repeated the observations, and confirms Krone's statement. Lippmann himself, however, states that two of his silver bromide albumen plates showed the complementary colors, by transmitted light. In these cases it is clear that the absorption must have been very small.

It is, however, a fundamental principle that, if a substance shows the same colors by transmitted light as by reflected light, those colors must be due to absorption (that is, are pigment-colors), and cannot be due to interference. The converse is also true.

Pigment-Colors in Becquerel Plates.—Having regard to the fact that the sensitive material in Becquerel's process has the same composition as the sensitive material in Seebeck's process, and that the colors obtained by the latter are entirely pigment-colors, there is on the face of it considerable probability that pigment-colors may also be produced in Becquerel's process. Although it has been established that the colors on the Becquerel plates are mainly interference-colors, this does not exclude the possibility that pigment-colors may also be present, and contribute to the observed effects. It is obvious, however, that if the interference-colors are strong, there may be some difficulty in seeing pigment-colors even though they are there.

It will be readily understood that the interference-colors may be weakened by longer exposure, owing to the spreading of the photographic effect beyond the nodes of vibration of the standing waves. Krone, as a matter of fact, found that by long exposure parts of the spectrum became white, and Becquerel himself states that in his process the color differences between different regions of the spectrum tend to disappear with increased exposure. With a view to test this, Wiener exposed some Becquerel plates for twenty hours, and others for thirty hours. With both times of

exposure the colors observed under the right-angled prism were very indistinet, but the plates that had received twenty hours exposure showed a slight shifting of the colors, whilst those that had received thirty hours exposure showed no shifting at all.

A more convincing proof of the presence of pigment-colors is derived from the observation, in transmitted light, of the films carrying the colored images. When the film is removed from the silver plate by the method already referred to, and is viewed by transmitted light it shows red, and a trace of blue in their proper places. In one experiment that Wiener made in this way, the blue was gray-blue and in another it was blue-violet. On the assumption that the interference-colors were still more or less masking the pigment-colors, that side of the films which had been in contact with the silver plate, and which still showed strong interference-colors by reflected light, was rubbed with chamois-leather until the interference-colors were much duller. On again examining it by transmitted light, it was fonnd that the red appeared to be more intense. It was not, however, a true spectral-red, any more than the red obtained by Seebeck's method, but it is noteworthy that it could be observed by transmitted light on the plates that had only been exposed for three-quarters of an hour.

It follows that in Becquerel's process, whilst the colors are mainly interference-colors produced by the action of "standing waves," pigment-colors are also formed, and the extent to which these pigment-colors contribute towards the colored image increases with the time of exposure.

Schultz-Sellack's objection to the general applicability of Zenker's theory therefore proves to be well founded in the very cases to which he called special attention. In other words, there are processes of color photography which cannot be explained by the theory of "standing waves."

The observations already described have established the fact that there are processes of photography in natural colors to which Zenker's theory of standing waves is not applicable. In other words, there are substances which, when exposed to light, are converted into other substances with a color identical with that of

the incident rays, and these products owe their color, not to interference, but to their own specific absorption, which is determined in the main by their chemical composition, though it may, to some extent, be influenced by their physical condition.

Weiner gives the name "color-receptive compound" to any substance which, when exposed to light rays of various colors, is converted into substances (that is, pigment colors) of corresponding colors.

PROPERTIES OF A PERFECT COLOR-RECEPTIVE SUBSTANCE: THEORETICAL BASIS OF COLOR PHOTOGRAPHY BY PIGMENT COLORS.—In the first place, in order that a sensitive substance may be chemically altered by a particular group of rays, it must absorp those rays. The converse is not necessarily true; rays that are absorbed may not produce chemical change at all, but their energy may be entirely converted into heat. In the first case, the effect is photo-chemical, in the second it is photo-thermal. The consideration of this somewhat complex question will be simplified if it is agreed at the outset that the term sensitive substance shall mean a substance which is sensitive to all the rays which it absorps, the sensitiveness being proportional to the co-efficients of absorption. It is known that there are substances which approximately satisfy this condition. At the same time, it may be well to bear in mind that the observations of Vogel, Acworth, and others, do not exclude the possibility that the maximum sensitiveness may not exactly coincide with the maximum absorption. It is also conceivable that a substance sensitive to various rays in proportion to its absorption of them may, by photo-chemical decomposition, be converted into colored products, which, in their turn, are sensitive in proportion to their absorption.

A perfect color-receptive substance must be a black substance, otherwise it cannot reproduce black, for black presupposes the absence of any effective radiations, and, therefore, the absence of any change, and it follows as a necessary consequence that the substance must be black to start with, if it is to reproduce black properly. Further, it must be sensitive in proportion to its

absorption, and its decomposition products must consist of substances sensitive to light in proportion to their absorption of rays of one particular color. These decomposition products must be of at least three colors sufficiently different to form in combinatian with one another, and with white, every mixed color. It must also be capable of producing white, which, however, may have the smallest tendency to form. It will be convenient to speak of the " fundamental colors," and " mixed colors," the latter being formed by combinations of the former. A substance of a given color will reflect only rays of that color well; the others will absorp those rays the more completely the more they differ from the particular color.

The incident colors, or illuminating colors, will, at first, coincide with a fundamental color. They will be absorbed by the black substance, and will produce decomposition, since by hypothesis the substance is sensitive in proportion to its absorbtion, and the products of decomposition will be substances of different colors. Those which do not correspond in color to the incident rays will continue to absorb those rays, since by hypothesis they are monochromatic, and hence must absorb rays of all colors differing from their own. Moreover, they are sensitive in proportion to their absorption, and, therefore, will be decomposed by the rays which they absorb. On the other hand, substances of the same color as the incident rays will not be further decomposed, because they reflect the rays, and do not absorb them. After a time, only these substances will be left, together with a little white, which, however, by hypothesis, will only be present in small quantity, and will only be produced to any marked extent by great intensity of illumination, or very prolonged exposure.

(To be continued.)

The excavations in Pompeii have just brought to light two bronze statuettes—one of a hare and the other of a serpent—that evidently served as ornaments on a fountain. Several bronze vases have also been unearthed.

NEITHER HERE NOR THERE.

THE remarkable amount of dense ignorance which exists in the ordinary lay mind regarding even the most elementary principles of photography would be astonishing were it not so common. For, when it is considered that we live in an age when nearly every alternate man is supposed to be an amateur photographer, and that every one of these in the course of his initiation is known to go through a period of blatant enthusiasm, which, one would think was sufficiently energetic to instil large quantities of optical and chemical knowledge even into a domestic servant, it ought to be more difficult to find an ignoramus than an adept in the theory of the black art. But we know it is so, for numerous writers on the lay press—and they are the layest people known—are continually "demonstrating their ignorosity" of the subject.

Still, I did think that that branch of photography known to the masses and the comic men who write jokes for the weeklies as "the X rays" had been sufficiently boomed in the last three or four months for all the world and his wife—yes, even his wife—to know that the bony photographs were taken without the aid of a camera. There is a "distinguished scientific investigator" (*sic*) who is most magnanimously allowing some of his experiences to be set down by a kind-hearted contributor to a certain monthly contemporary which is blessed with the largest circulation of any magazine; and this scientist (*sic* again) saves an interesting young man from being hanged on overwhelming circumstantial evidence for killing his favored rival on the eve of that gentleman's wedding. And this is how he does it. He reflects that the favored rival is the possessor of a very rare and valuable diamond, which he guards most carefully; that he is also the possessor of an Indian servant, a mystical gentleman, of a somewhat "slithy" and snaky description and a silent footstep; that this individual, after drawing out his face to its greatest length, announces on the morning that the murder is discovered that the diamond is lost also.

So the scientist, being a bit of a Sherlock Holmes, puts two and two together and thinks it possible that the black gentleman may have murdered his master for the sake of the diamond. Of course, nobody else had thought of *that*. Then, as luck would have it, who should walk into the laboratory but the black gent himself—who had heard of the scientist's skill—complaining of a frightful stone—I mean,

internal pains—which he wanted cured, for, you will observe, he was a good all-round kind of a scientist. What does the scientist do? Why, he lays the poor suffering Injun on a table, and, after observing that his Crookes' tube is giving off the X rays plentifully, "*takes the cap off the lens . . . .*"

It is hardly necessary to say more. The plate is developed, and shows the gold setting of the diamond sticking in the black gent's interior, whereupon he owns up and dies. So they cut the stone out and show the photograph to the police, who immediately see the whole thing now; the young lady gets brain fever, and so on. But what I want to draw attention to is the fact that there is a very large class of persons who never read any form of literature except the story form, and such ignorant story-writing as this does a lot of harm in preventing such persons from forming anything like a true idea of important scientific discoveries like that of Roentgen. No one objects to a good story well told, even if it has "lost nothing in the telling," for we all have a "bit-of-a-liar-myself" sort of feeling deep down in our heart of hearts. This is a good story; but the X ray business is merely an accessory, and there was nothing to prevent it being properly done except the writer's ignorance. Story-tellers' license should never be brought up as an excuse for perverting scientific truths, even when the exigencies of the story demand that those truths should be so preverted. But, when a man clothes himself in the garb of a scientist in order to give his fiction the semblance of reality, he should, in common decency, make himself familiar with the elementary laws of that science which he proposes to make his servant.

Peripatetic, in Photo. (*London.*) *News.*

A Plot.—"I guess I've found a way to take the conceit out of that amateur actress," remarked the girl who is not always good-natured.

"How did you do it?"

"Introduced her to an amateur photographer who wanted to take her picture."—*Washington Star.*

In the Wrong Shop.—"But, Mr. Daubs, I don't think it looks a bit like me."

"My dear madam, if you want a likeness you should go to a photographer. I am an artist."—*Harper's Bazar.*

The Editorial Dropshutter.

A Disastrous Conflagration.—The large plant of the National Photo-Paper Company, on Wilbraham Avenue, in Springfield, Mass., was destroyed by fire on the evening of August 10th, entailing a loss of over $35,000 to the company.

It was just before 9 o'clock when people living near the mill were startled by an explosion which was followed by a flash of fire in the rear of the top floor of the mill. An alarm was at once sounded, but the flames were making good headway before the first stream of water was put on. The roof with its tar covering made a hot fire, and the upper floor and stock burned like tinder. Except in a few places the fire was kept confined to the upper floor, but the torrents of water poured into the building by the engines did deadly work when it came in contact with the delicate stock of photographic paper which was on the lower floors. The fire department worked nearly two hours before the fire was considered under control.

The origin of the fire is the cause of much dispute. Those living in the vicinity claim that there was an explosion previous to the appearance of any fire. It would seem that there can be no doubt that there was an explosion, for the entire upper part of the rear wall of the building was blown out and piles of bricks are scattered for some distance beside the tracks of the New England Railroad, which passes directly in the rear of the mill. Superintendent Mumford says he cannot understand how there could have been an explosion, at least of chemicals, as the latter are kept in a vault under ground, except a few, which are kept in the middle of the room on the upper floor.

Though this was the room where the fire was first seen, the explosion was in the rear and not near the center of the room. He believes the fire originated on the roof, a spark from a locomotive which passed shortly before the fire was discovered being responsible for the fire, and the story that William P. Wood, the company's master mechanic, tells, tends to confirm this theory.

The building is equipped with thermostats and also with an automatic alarm connected with the Winchester park engine house, and neither of these commenced working until after the fire was seen.

The upper floor, which was practically wiped out, was used as an emulsion coating room, laboratory and packing room, the floor below being occupied by the offices and calender and surface coating rooms,

while the mixing room was in the basement. Here also was the storage vault for chemicals.

The company had not yet sent out all kinds of its product and this week was to place on the market the last of its finished goods. In manufacturing the paper several delicate imported machines are used. These were destroyed, and the resumption of business by the company will necessarily be delayed in waiting for the replacing of its machinery.

The mill and stock were insured for $35,000. The officials of the company could not state what the loss would be, but intimated the loss would not be much inside the amount of the insurance.

The company was originated in December and has practically only just commenced business. The officers are: President, Elijah Belding; Secretary and Treasurer, O. S. Greenleaf; Manager, J. B. Mumford.

Another Novelty.—A silvered albuminized paper ready for use, is offered by the Emulsions-Albumin-Papier-Fabrik Actiengesellschaft, of Cologne, Germany. It is claimed to be very sensitive to light, and almost unlimited in its durability, and unites all the advantages of the common albuminized paper and those of the celloidin and gelatin makes, without any of their defects.

The new invention has the coating of the ordinary albuminized paper and can be toned in any one of the usual gold baths and finished and retouched in any manner known to photographers.

The new paper is introduced to the commercial world under the legally registered name, "Emulsions Albumin Papier" (Chloride of Silver Emulsion Albumin Paper).

The photograph gallery of George W. Day, at Norristown, Pa., was completely destroyed by fire on the morning of July 12. The flames were detected shortly after four o'clock by a mill watchman, who, however, being required to remain at the mill until relieved by the day watchman, could not sound an alarm, and it was fully an hour afterwards before firemen reached the scene, although there are two engine houses within two squares of the place. The building, an old structure, was badly wrecked, entailing a loss of about $1000. Photographer Day's loss comprises many finished pictures, twenty thousand negatives, picture frame mouldings, and the outfit of a complete gallery. He has an insurance of $1700. It is supposed the fire was started by the explosion of some chemical used in photography.

Photographic Hints and Formulæ.

The Influence of Hypo in the Metol Developer. — The influence of hyposulphite of soda on the metol developer is a question worthy of research, and it gives me pleasure to make known my experiments in this direction.

It will no doubt seem strange that hyposulphite of soda should have a beneficial effect in any developing solution, the characteristics of this chemical rather foreshadowing a deleterious influence. This, however, is not so in practice, the presence of hyposulphite of soda in small quantities being of great advantage in metol-developing solutions.

My primary experiments consisted of a comparison of the following:

A. Water	1,000 minims.
Metol	15 grains.
Sulphite of soda	150 "
B. Water	1,000 minims.
Carbonate of soda	330 grains.

Twenty parts of A to ten parts of B and thirty parts of water were then mixed ready for use.

A pyrogallic-acid developer of normal strength was then prepared as follows:

A. Water	1,000 minims.
Suulphite of soda	200 grains.
Pyro	28 "
B. Water	1,000 minims.
Carbonate of soda	100 grains.

Twenty parts of A, twenty parts of B, and parts of water were then mixed ready for use.

These two solutions were placed in separate trays. A number of plates of one emulsion were now exposed under a Warnerke sensitizer, thus assuring equal exposure, and a plate was placed into each solution of developer at the same moment. The developer was continued until the number of the sensitometer representing the speed of the plate was of like density on both plates.

Upon fixing the plates it was apparent that the negative developed with metol, although showing greater details, was not quite as brilliant as the pyro negative.

Further test was made with new solutions prepared by exactly the same formulæ, adding to the B solution of the metol development 1,

2, 3, 5, and 10 parts of hyposulphite of soda. The developer which contained one part of hyposulphite of soda gave a result equal in brilliancy in every respect to the pyro developer with fine contrast and an absolute clearness. The absolute freedom from fog in the metol solution thus prepared was remarkable, and in many respects the negative was to be preferred to the result obtained with pyrogallic acid.

The addition of hyposulphite of soda to the metol developer acts as a retarder to a certain degree, and certainly prevents fog. Greater detail is obtained than without its use, although if the hypo is increased in quantity the effect is exactly reversed.

Satisfied that this subject was worthy of further research, I experimented for some time with the following.

METOL-HYPO DEVELOPER.

A.	Water	1,000 minims.
	Metol	15 grains.
	Sulphite of soda	150 "
B.	Water	1,000 minims.
	Carbonate of soda	330 grains.
	Hyposulphite of soda	1 grain.

For studio work I found best suited forty parts of A, twenty parts of B, twenty parts of water. For landscapes, twenty parts of A, ten parts of B, thirty parts of water.

In my experiments I invariably tested this developer against a normal pyrogallic-acid developer (which I had previously adopted for general use in the Academy), and found that metol-hypo developer prepared after the above formulæ gave most excellent results for both portraits and landscapes, and that the results were fully equal, if not superior, to pyro developer.—*Dr. J. M. Eder.*

Removing Hydroquinone Stains.—If you are obliged to keep a hydroquinone developer on a plate for a rather long time you will find that, after fixation, the plate shows a yellow stain. In the case of "stale" plates you will find that this stain takes the form of a bluish metallic-looking deposit. Such hydroquinone stains are more difficult o remove than those caused by pyro, but I have invariably found them to yield to the following treatment:—Make some fresh hypo solution of strength about twenty grains to the ounce, add to this a few drops of a solution of ferricyanide of potassium until the liquid is of a pale lemon-yellow color. Dip a clean tuft of cotton wool in this liquid, squeeze out excess, and sponge over the surface of the negative

with the moistened cotton wool. The yellow stain will rapidly disappear. Flood the plate with water and wash thoroughly as usual. Remember that the solution is a reducer, and if used too strong or for too long a time will alter the density-ratios of the negative. As used in above dilute state it will remove the stain before it has time to attack the silver deposit.

To Prevent Tarnish on Brass.—An excellent tarnish preventive for brass bedsteads and other articles, is made as follows: Take a quarter of an ounce of shellac and a quarter of a pint of methylated spirit, place these ingredients in a glass bottle, and cork. Shake the bottle well, and keep it in a warm place for a few days. Pour off the clear fluid and apply it to the brass with a camel's hair brush. The brass should be well cleaned, polished, and also, if possible, heated before the varnish is applied.

To Make a Bottle Pour Well.—Probably most photographers have experienced the annoyance of the developer, when being poured out of a bottle, persisting in running down the side and dripping from the lower edge of the bottle. This can easily be prevented by simply painting the rim with melted paraffin. Do not let the paraffin get on the surface of the lip. The best way to apply it is with a small hog-hair brush. You will find that it is easy to deliver the liquid in single drops from a bottle treated in this way.

To Remove Red Spots from Plate Glass Slides.—These are due to the oxide of iron polishing powder, left adhering to the bottom of the deeper pits, made in grinding the glass surface, and which have not been removed in the polishing operation. Sometimes they are too numerous and conspicuous to be tolerated. A short rubbing with whiting and water will clean out the red matter more quickly than acid treatment. The pits will be left, but they will not be so noticeable as before, and in case a mounting medium is used having nearly the same refractive power as the glass, they might escape observation.

Saturated Solution.—A Contrivance for Facilitating.—Invest a penny at any toy shop in the purchase of a thin and flexible cane. By means of a knife, split this longitudinally into four equal strips. From one of these four pieces make a circular loop of about six inches in diameter. Now take a piece of thin open canvas, say a foot square, trim away the corners so as to leave it eight-sided. Fold the edge of the canvas over the cane hoop, and sew on firmly with

strong white or gray carpet thread. When done, the middle of the canvas should "sag" down about six inches in somewhat of a cup shape. Suppose that we want to make a saturated solution of hypo, select a wide-mouthed jug, of such size that the canvas strainer easily fits its mouth, and that the cane ring prevents its slipping into the jug. Fill up the canvas bag with pieces of hypo broken tolerably small, but not small enough to fall through the openings of the canvas. Then pour water over them until it *just* touches the bottom of the bag. Solution here rapidly takes place, and the upper crystals fall down and take the place of those already dissolved. From time to time more hypo is added until it ceases to dissolve; when we have a saturated solution. This contrivance is of great use in preparing a saturated solution of potassium oxalate for platinotype work. In the case, however, of oxalate, alum, soda sulphite, iron protosulphate, it is convenient to use wide-mouth bottles (*e.g.*, pickle bottles, or those used for store bottles in sweets shops), and make a canvas apparatus for each bottle. In such case the cane ring should be trifle larger than the bottle neck, and the canvas bag should form a long narrow cone. To form this, cut the canvas in the shape of a sector of a circle.

A Simple Method of Combination Printing.—The following is one of the simplest ways known for combining parts of two or more negatives upon one print. Supposing, for instance, we have a charming landscape, lacking only a ruminating cow in the foreground to to make it perfect, the first thing we must do to supply the deficiency is to hunt around until we can secure a negative of an appropriate animal in suitable position. It matters not whether the cow be taken in a meadow or the farmyard, so long as she is lighted from the same direction as the landscape.

We must then enlarge or reduce the negative until the cow is the exact size we want for the space she is to occupy, unless we have been able to take her the proper size at the first shot. Upon the film side of the cow negative we must block out everything but the cow, following the animal's outlines with the greatest care. The best thing to use for this purpose is a water "Opaque," or a mixture of vermilion and gamboge.

Having determined the exact position we wish the cow to occupy upon the print, we must adjust a piece of paper and print to the requisite depth.

At this stage the lonely cow will look quite statuesque upon the bare field of white paper, but a trifling amount of work will entirely alter her appearance. The figure of the cow (upon the paper) must next

be carefully painted over with gamboge watcr-color, so that every part within the outlines is covered. When quite dry, the print must be adjusted over the landscape negative and printed in the usual way.

The gamboge can easily be removed in the first washing water, by wiping carefully with cotton-wool, and toning can then be conducted in the usual way.

Should there perchance be any white spots (due to careless blocking out of the cow) visible on the print, they can be removed by spotting out with a mixture of India ink, crimson lake, and Prussian blue, in proportions to match the tone.

Working on the Back of the Negative, or Retouching for Broad Effects.—Professor Fritz Luckhardt frequently adopts the plan of covering the back of the glass with collodion slightly tinted with a coloring material. When dry, the film is scraped away when not wanted; that is to say, where one wishes the negative to print with full vigor. A layer of matt varnish slightly tinted may now be applied, and a second scraping away to suit the subject can be performed. Shading wlth blacklead powder applied with a stump, and partial masking with fine tissue paper, may come in at this stage, while the paper may form a fresh basis upon which blacklead work may be done. A few drops of aurantia solution in alcohol may be added to plain collodion or matt varnish as purchased or prepared, so as to give the required depth of tint; but in the case of all considerable operations at the back of the negative, trial should frequently be made. Those who prefer to prepare their own plain collodiбn can do so by agitating 10 gr. of pyróxyline with an ounce of strong alcohol, and then adding an ounce of ether. A convenient formula for matt varnish is the following:

Gum sandarac, ...	18 parts.
Gum mastic, ...	4 "
Ether, ...	200 "

Dissolve, and add 100 parts of benzole.

Metol Developer for Photo-Micrography.—There may be nothing new in this formula, but as I have not heard or known of its use in this way, and as the editor of this department often writes, "Give us ideas illustrating how you do it," I give it in hopes some one may find in it a developer that suits them. I usually used Cramer's metol formula, but being out of bicarbonate of soda, I tried it without, and to my mind it comes as near a universal developer as any I know

of. It has many excellent qualities, among which are its durability and the clearness and brilliancy of the negatives, it does not discolor the fingers like pyro and other developers, it may be used for lantern slides, bromide prints, etc. Dissolve 45 grains of metol in 9 fluid ounces of water, add 1¼ ounces of sulphite of soda, and it is ready for use. In using, all that is required is to carry the development far enough, and you will get nice clear plates, that will repay the trouble. I do not think there is much danger of over-developing; it can be used repeatedly until too weak. The metol in powder you can get of any dealer.—*The Observer.*

Bicycling Not a "Craze."—It is an error to call bicycling a "craze." It is something very different from that. The simple fact is that the human race has discovered a new power for its own use. From the earliest dawn of civilization man has been experimenting with the wheel which he invented to increase his powers of locomotion. Finally he has hit upon a device which makes his own body the source of power. He has placed wheels upon his feet, and as a result finds his powers of locomotion multiplied by five and even ten. Instead of walking five or ten miles with more or less effort and fatigue, he finds himself traveling ten, twenty, fifty, and even a hundred miles, according to his physical vigor and experience, with little perceptible fatigue and with a most delightful sense of animation. He has become master of his new power,—the most valuable he has acquired since he learned to walk,—and it is henceforth a part of his equipment for his struggle with life. Is it probable that having once become possessor of a power like this the human race is going to abandon it? As well might we expect it to abandon railways, and gas, and electricity!

"**How fallacious** some of these proverbs are," remarked the sagacious man. "Take, for example, that one about there being nothing new under the sun."

"Is there anything really new?" said his wife.

"Of course there is. Don't you read the papers? Don't these X rays enable you to take a man and see light through him?"

"Yes, William, dear," she answered, gently, "but any woman could do that before X rays were even thought of."

Photographic Scissors and Paste.

Nature Printing for Students of Botany.—Mr. E. M. White, in a contribution to the *Photogram*, describes what he calls "nature printing," as follows:

This process should commend itself to all who study botany and other branches of natural history, inasmuch as it enables faithful and accurate copies of specimens to be made without the aid of a camera. The method of working is as follows: We shall want a printing-frame, a piece of good stout glass, free from flaws, cut to fit the frame; and some of gelatino-chloride paper. Having procured a specimen, such as a spray of maiden-hair fern, or as in the example, a skeleton poplar leaf, we place it in the frame behind the glass, and over it a piece of sensitive paper (care must be taken to place the flatter side of the specimen against the paper); expose the whole to a bright sun until the background, or uncovered portions of the paper, have darkened as much as they will; then take the resulting negative print, and tone to a good non-actinic tone, such as chocolate; fix in the ordinary manner, wash and dry as in a print. In printing a positive it is only necessary to place a new piece of paper in the frame in contact with the negative print, using the glass as before, and print in bright sunlight. The printing, of course, takes a long time, owing to the light having to permeate the paper

A Great Manufacturing Industry.—Few journalists realize the fact that no single important industry in the United States shows such a continued and remarkable growth during the last forty years as that of the manufacture of newspapers and periodicals. For instance, in 1850 the aggregate circulation per issue of all classes of newspapers was a little over 5,000,000 copies. In 1860 it had increased nearly threefold, aggregating about 14,000,000. In 1870 it was 21,000,000; in 1880 32,000,000 and in 1890 it had doubled, reaching a total of 70,000,000. When we turn to the aggregate number of copies issued of all the newspapers during the year, we are dealing with billions, not millions. From less than half a billion copies forty years ago, we find that the newspaper press had, in 1890, increased more than tenfold, and can now boast of a total annual aggregate of about 4,700,000,000 of copies. At the same rate of increase of circulation, we must now be printing 6,000,000,000 of copies annually. It is well

to bear in mind, in presenting these facts, that I am referring to newspapers and periodicals. If I were to include the totals for different branches of the printing and publishing industry, we would show an annual value product of over $275,000,000, a total of nearly $78,000,000 paid in wages, and of 165,227 persons employed. By far the greater value of these totals is represented by newspapers and periodicals. The capital invested in the newspaper business has more than doubled; that is, it has increased from $53,000,000 to $126,000,000; the number of employees has increased from 71,615 to 106,095, and the total of wages paid has gone up from $28,560,000 to $68,602,000.—*R. P. Porter.*

Visible X-Rays.—Dr. Brandes, of the University of Halle, has succeeded in rendering directly visible the X-rays discovered by Prof. Roentgen. The observation made by Prof. Salvioni, an Italian physicist, that lenses are in a very slight degree penetrable by Roentgen's rays, suggested to Dr. Brandes the idea that the invisibility might be due to circumstances connected with this fact. He accordingly resolved to test the effect of Roentgen's rays on lenseless eyes. There are many people who have had the lenses of their eyes removed as a remedy for extreme shortsightedness or for cataract. A girl who had had the operation performed on both eyes, but in whose right eye a remnant of the lens had been left, allowed the experiment to be tried upon her. Professor Dorn, whom Dr. Brandes had interested in the investigation, subjected the girl quite unexpectedly to the rays, and when the strong current passed through the tube which had been totally darkened, she declared that she saw light with her left eye. Professors Dorn and Brandes at first thought it possible that a spark had leaped across, but when this had been rendered impossible, the girl continued to declare that she saw light. On further trying the experiment the two savants saw the light, too. They then continued their investigations, and ascertained that Roentgen's rays really affect the retina. If we place our head, completely enclosed in an entirely opaque vessel, near the source of the rays, we see light even with the closed eyes, and see it most clearly at the periphery. Moreover, we continue to see it even when a large aluminum plate, which would completely exclude electric rays, is placed between a Hittorf tube and the eye. Utter darkness, on the other hand, results if a thick pane of glass, which, as is well known, is only in a very slight degree penetrable by Roentgen's rays, is placed between the tube and the closed or covered eye. Herren Dorn and Brandes hope to ascertain by further

experiments whether Roentgen's rays directly affect the nervous parts of the eye, or whether they only render parts of the interior of the eye fluorescent, and thus indirectly create the impression of light.

How to Pack a Trunk.—The marvel of good packing—packing f clothes, I mean—is that it is so simple: when you see for the first time a professional French packer put up your best gowns you feel sure you will come to your journey's end without a rag to wear. He puts three times as many things in the same space as you would.

The cardinal point is to wrap up every delicate garment separately: of course it should be folded smoothly, and to teach how to fold clothes in print is not easy. Any good dressmaker, however, can give you points on that, and the wrapping is the more important thing. Pin towels or sheets of tissue paper about your garment, but remember that newspapers are what you should fold between each layer of pretty things in the trunk. Nothing else is so good; it is so unyielding that wrinkles and protuberences cannot make themselves felt through it to mark the fabrics beneath them any more than if you had used sheet iron. It is useless to try to arrange heavy things at the bottom, light on top. The baggage smashers know no top and no bottom; just concentrate yourself on keeping a smooth, even surface for each successive layer. Bows and sleeves can be stuffed out with newspapers better than anything else. Be sure that your wrappings are pinned firmly so that there will be no coming undone; they are your bulwarks.

In packing breakable articles it is astonishing how many people will jam them down in corners and sides, where they get the full force of every concussion against the unyielding walls. Tie on your corks well, and put your bottles near the middle of a compartment and you may carry ink and shoe dressing in safety around the world.

In packing such things as delicate hats, bonnets, and fancy waists of such a frou frou nature that no pressure can be allowed on them, it is still better to fill up the empty space of the boxes allotted them with lightly twisted sheets of tissue paper than give them to a chance to move, and with all due respect to the best packing in the world, it is still well to unpack as soon as you can.—*Philadelphia Inquirer.*

"**I feel** very anxious about my daughter, doctor."

"What are her symptoms?"

"She isn't able to endure anything. This morning she was all worn out after a little run of fifteen miles on her wheel."

Photographic Literature.

The Photolithographie. By George Fritz. Wilhelm Knapp, Halle, a. S. No. 11 of the Enclyclopædia of Photography.

A work of about 160 pages, with 8 plates and 8 illustrations in the text. This work by Dr. Fritz covers the whole field of photolithography. It commences with the theory of lithography, with the preparation and etching of the stone, giving formulæ for every process. It then treats of what are known as direct, or black and white reproductions, drawing and transfers from prepared papers, and reproduction of prints in the various sizes. It next treats of the photographic process in connection with lithography, giving full directions for the use of chemicals, camera and prism, also practical suggestions for the transfers to stone or zinc, and the methods for direct copying upon both of these supports, as well as the half-tone process, or autotype, as it is known in Germany, and the photogravure or intaglio process on stone. Full directions and formulæ are given for every process. Not the least interesting and valuable features in this book are the samples of grained drawing paper, suitable for crayon drawings. The work may be obtained either direct or through the publishers of this journal.

Der Halbtonprozess. By Julius Vervasser, translated by Dr. G. Aarland. Wilhelm Knapp, Halle, a. S., 1896.

This valuable volume of 114 pages, with numerous illustrations in the text, is part 23 of the Encyclopædia of Photography, now being published by the great publishing house of William Knapp, in Halle. This work originally appeared in the English language, and on account of its merit in practical suggestions and formulæ, was translated into the German language, and chosen as an authority for the half-tone process in this great encyclopædic work. The translation has been carefully and conscientiously done by Dr. Aarland, of Leipsic. The typography is fully equal to the standard.

Died of Work at X-Rays.—Dr. William Shrader, head of the Department of Electricity in the University of Missouri, died at Columbia, August 15th. Death was due to brain fever, caused from overwork experimenting with X-rays.

Wise and Otherwise.

The heavy losses of sugar plantations in Cuba is expected to produce higher prices in sugar in this and other countries soon.

With the new photography, hotel proprietors can keep shadowgraphs of the various fish, to enable customers to locate the bones.

After a woman has her picture taken with her first baby, she doesn't sit before a camera again until she figures in a family group as a grandmother.

Alaska is now as great an occasion for a gold craze as was California in 1849. Many adventurers are on their way in search of the shining ore.

A rich mine of platinum has been discovered in Colorado, at the foot of Buffalo Peak. It is the third valuable mine of platinum in the United States.

A new invention is announced. It is a phonographic watch. The hours are called off by a human voice from a small revolving cylinder upon which the words had been spoken.

A scientific exploring expedition in charge of Prof. Hite, of the University of Pennsylvania, will sail for Labrador this summer. Over fifty students and scientists have engaged passage. The study of geology, archæology, botany and zoology, will engage their attention.

The Impressionist Called Down.—The Cow—"Lookahere, lemon-colored rocks, pink stone walls, purple trees and calico skies are matters concerning you and your conscience, but—if you don't stop painting in my calf Nile-green there'll be simply a flat tone left of an interesting but wayward young man. Do you tumble?"—*Life.*

Managed to Get Along.—"What do you and your friends do for dishes?" asked the old maid of a tramp who was just leaving her back door with both hands full of a bountiful supply of cold food that she had given him.

"Well, mum," replied the tramp politely, "we get along without plates, you know, because it's work to wash 'em; but we each of us has a big knife, and we generally use one of the forks of the road."

—*Somerville Journal.*

In the Twilight Hour.

SEEK self and you will find Satan.

INDIFFERENCE is worse than opposition.

ANGER is a weapon we hold by the blade.

CULTURE is the nickel finish on the outside of the cylinder, love is the stream within.

THE church needs piety to win souls more than it needs money to build costly structures to be proud of.

THE most gladsome thing in the world is that few of us fall very low; the saddest that, with such capabilities, we seldom rise high.—*Barrie.*

AS the light and warmth of the sun's ray is answer enough to those that would complain of his spots, so the light shed by the Bible on life's pathway, and the inspiration and comfort afforded human hearts, is sufficient defense against all cavilers.

THERE is seldom a line of glory written upon earth's face, but a line of suffering runs parallel with it; and they that read the lustrous syllables of the one, and stoop not to decipher the spotted and worn inscription of the other, get the least half of the lesson that earth has o give. —*Sabbath Recorder.*

THERE are those to whom it seems natural always to be cheerful and obliging. And how much more agreeable is their presence than the society of those who from indifference or moroseness are never pleased! They affect us like the soft, balmy. air and bright sunshine of a June morning, which, when we feel and breathe, we think unequaled by any other joy.

THINK that to-day shall never dawn again.—*Dante.*

GOOD character is property. It is the noblest of all possessions.—*Samuel Smiles.*

I HAVE lived to thank God that all my prayers have not been answered.—*Jean Ingelow.*

THE consciousness of duty performed gives us music at midnight. — *George Herbert.*

PEOPLE will go anywhere barefoot to preach their faith, but must be well bribed to practice it.—*Ruskin.*

BE strong by choosing wisely what to do: be strong by doing wisely what you have chosen.—*Samuel Osgood.*

IF a man is unhappy, remember that his unhappiness is his own fault; for God has made all men to be happy.—*Epictetus.*

DIVINE knowledge is not as the light o the moon—to sleep by—but as the light of the sun — to work by. — *Rev. William Secker.*

SEEK not proud riches, but such as thou mayest get justly, use soberly, distribute cheerfully and leave contentedly.—*Bacon.*

THE one that can labor patiently, quietly waiting for recognition through all his toil, if it come; and if recognition comes not, can still continue. is the true nobleman.

TRUE peace consists only in the possession of God, and the possession of God here below is only to be found in submission to the faith and in obedience to the law.—*Fenelon.*